4.14.2.5 Impacts from Alternative 2—New Transmission O'Banion Substation to Elverta Substation and Realignments

Alternative 2 would have the same impacts described for the new construction, realignment, and abandonment portions from O'Banion Substation to Elverta Substation of the Proposed Action.

4.14.2.6 Impacts from Alternative 3—New Transmission Elk Grove Substation to Tracy Substation

Alternative 3 would be adjacent to existing transmission lines for its entire length from Elverta Substation to Tracy Substation. These and other existing lines in the area dominate the landscape. This alternative would traverse mostly agricultural fields, where visual quality is average and visual sensitivity is low to moderate. However, at one point, Segment E_1 crosses the Cosumnes River Preserve (MP 3.0 to 3.5) where at the river, the incremental visual impact would be moderate. The overall incremental visual impacts of Alternative 3 line would be low.

4.14.2.7 Impacts from the No Action Alternative

No action would result in no new impacts to visual resources. During periodic maintenance and operation of Western facilities and ROWs, workers and their equipment could draw some visual attention for a short time. However, these impacts would not be significant. Mitigating measures would not be required because there would be no new impact on visual resources. Residual impacts would be negligible.

4.15 WATER RESOURCES

4.15.1 Affected Environment

Water resources and hydrology include surface and groundwater resources in the study area. These resources provide drinking water and agricultural irrigation water, as well as habitat for fish and wildlife species. This section characterizes the water and hydrological resources in the study area and assesses the potential impacts of the Proposed Action and alternatives.

Activities affecting water resources would fall under the CWA (33 U.S.C. § 1251-1387), Section 404 (31 U.S.C. § 1344) permitting requirements, Section 10 *Rivers and Harbors Act* (33 U.S.C. § 403) permitting requirements, and 401 Certification (33 U.S.C. § 1341). Jurisdictional entities include the Central Region of the DWR and the Sacramento District of the USACE.

4.15.1.1 Resource Study Area

Constructing and maintaining the transmission line and associated access roads could impact water resources. Potential impacts would be limited to the ROWs for the transmission line, pulling and tensioning sites, any construction office or laydown areas, and access roads. Potential impacts could occur on existing access roads as well as new roads. While there could be some limited potential impacts beyond the ROWs boundaries (for example, in the case of a spill into a creek or ditch), it is impossible to define the boundaries for such potentialities. Therefore, this analysis considers the area within the ROWs to be the affected environment, as physical impacts to water resources should be limited to those areas.

4.15.1.2 Issues of Environmental Concern

Issues of environmental concern for water resources include erosion, compaction, sedimentation from construction disturbance, blocked drainage, introducing construction debris or other fill into surface waters, spills of petrochemicals or other contaminants that could reach surface water or groundwater, impacts from excavating structure foundations, damage to irrigation improvements, and depleted water resources. These issues are somewhat heightened for the Proposed Action and alternatives due to the large number of ditches, canals, rivers, and creeks, and the proximity of the water table to the land surface.

4.15.1.3 Characterization

The Proposed Action and alternatives are in the central portion of California's Central Valley. To the north is the Sacramento Valley, and to the south the San Joaquin Valley. Surface water drains toward the study area, from which the region drains generally south-southwest, converging into the San Francisco Bay Delta and ultimately the Pacific Ocean by way of San Francisco Bay. The DWR has established subbasins within the Central Valley; the Proposed Action and alternatives are in portions of the Southern Sacramento Drainage Basin, the eastern portion of the Delta Drainage Basin, and the northern portion of the San Joaquin Drainage Basin.

The northern portion of the study area is primarily drained by the Sacramento River and its larger tributaries, including the American and Feather rivers. The southern portion is drained by the San Joaquin River and its tributaries, including the Cosumnes, Middle, and Old rivers. The San Joaquin River in this area is also the eastern part of the Stockton Deep Water Channel.

Irrigated agriculture on the flat valley floor in the study area has led surface water resources to be heavily devel-

oped. To the north of Sacramento, irrigation water floods rice paddies. South of Sacramento, there are extensive networks of irrigation ditches and canals, improved natural creeks, ponds, lakes, and other irrigation system. Some irrigation ditches and canals are managed by the Bureau and USACE. Many systems are managed by irrigation districts that the transmission lines traverse. These irrigation districts are listed below.

- Sutter Butte Mutual Water Company
- South Sutter Water District
- Natomas Central Municipal Water District
- Rio Linda Water District
- City of Sacramento Water Service Area
- Sacramento County Water District
- Citizens Utility Company
- Omochumne-Hartnell Water District
- Woodbridge Irrigation District
- Woodbridge Water Utility and Conservation District
- Central Delta Water Agency
- Stockton East Water District
- South Delta Water Agency
- Byron Bethany Irrigation District

In general, the study area falls into three main categories: urban; mixed agriculture and newer residential development; and agriculture. Much of the agricultural area is irrigated. A given field may be irrigated or not in any particular year depending on the crop. The area has abundant surface water in lakes, ponds, wetlands, sloughs, creeks, irrigation canals and drainages, and flooded fields. The water table is near the ground surface throughout the study area, which is essentially one large floodplain.

Table 4.15-1 lists all water bodies crossed by the segments of the Proposed Action and alternatives, and the following paragraphs describe the water resources by segment from the northern end of the study area to the southern end. See Figures 3-2 to 3-7 for segment locations and milepost information.

Segments A and A_1, which are the same route except for a minor deviation at Pleasant Grove Cemetery, leave O'Banion Substation and trend generally southeastward along the northeast dike of the Sutter Bypass, a 0.75 to 1 mile-wide drainage channel. Segments A and A_1 are 22.4 miles long and pass through very flat, flood irrigated cropland including rice paddies. The segments span or are near irrigation canals, drainage ditches, creeks, wetlands, and marshes. At MP 9 of Segments A and A_1, the route diverges from the Sutter Bypass and crosses the Feather River perpendicularly at MP 11.5 and the East Side Canal at MP 17.5. This area is predominantly cropland, becoming mostly grassland at MP 10.5.

Segments A and A_1 intersect Segments B and F about 4.2 miles north of Elverta Substation. Segments B, F, G, and H form a quadrilateral approximately two miles wide and four miles long north of Elverta Substation. This area, like that to the north, is very flat and drained by various creeks, sloughs, and ditches. The area is mainly pastureland with some cropland.

Segment C is 11.2 miles long and extends from Elverta Substation into the Sacramento metropolitan area, ending at Hurley Substation east of downtown Sacramento, just north of the American River. The area south of Elverta Substation is flat, mixed irrigated agricultural land and pastureland that is rapidly being converted to suburban housing developments. Surface water remains abundant, with the route crossing several creeks, canals, and ditches—many of which drain into the Natomas East Drainage Canal.

Table 4.15-1. Water Crossings

Segment	Milepost	Water Body[1]	CA Quad	County	Width[2] (feet)	Directions	Structure Number
A	2	Gilsizer Slough	Gilsizer Slough	Sutter	150	N to S	137/1-138/1
A	11	Nelson Slough	Nicolaus	Sutter	<100	NW to SE	146/1-147/1
A	11.5	Feather River	Nicolaus	Sutter	500	NW to SE	146/1-147/1
A	13.5	Coon Creek	Verona	Sutter	<100	NW to SE	148/1-149/1
A	15.25	Bunkham Slough	Verona	Sutter	<100	NW to SE	150/1-151/1
A	16.8	Bunkham Slough	Verona	Sutter	<100	NW to SE	150/1-151/1
A	17.3	East Side Canal	Verona	Sutter	150	NW to SE	152/1-153/1
A	19.75	Pleasant Grove Creek	Pleasant Grove	Sutter	<100	NW to SE	155/1-156/1
A	21	Curry Creek	Pleasant Grove	Sutter	<100	NW to SE	156/1-157/1

Table 4.15-1. Water Crossings

Segment	Mile-post	Water Body[1]	CA Quad	County	Width[2] (feet)	Direc-tions	Structure Number
C	0.7	Natomas East Main Drainage Canal	Rio Linda	Sacramento	<100	W to E	0/6-0/3
C	7.7	Natomas East Main Drainage Canal	Sacramento East	Sacramento	150	N to S	7/1-7/5
D	2.5	American River	Sacramento East	Sacramento	250	NW to SE	13/2-13/4
D	6.2	Morrison Creek	Carmichael	Sacramento	<100	N to S	17/1-18/2
D	7.8	Elder Creek	Elk Grove	Sacramento	<100	N to S	18/2-19/1
D	12.8	Laguna Creek	Elk Grove	Sacramento	<100	N to S	23/1-24/1
D	14.6	Elk Grove Creek	Elk Grove	Sacramento	<100	N to S	25/1-26/1
E	1.7	Small Lake	Galt	Sacramento	200	N to S	28/1
E	2.25	Lake	Galt	Sacramento	350	N to S	28/1-29/1
E	3.5	Cosumnes River	Galt	Sacramento	250	N to S	29/1-30/1
E	4.4	Badger Creek	Galt	Sacramento	<100	N to S	30/1-31/1
E	5.25	Intermittent Stream	Galt	Sacramento	<100	N to S	31/1-32/1
E	6	Laguna Creek	Galt	Sacramento	<100	N to S	32/1
E	6.8	Intermittent Stream	Galt	Sacramento	<100	N to S	32/1-33/1
E	7.6	Deadman Gulch	Galt	Sacramento	200	N to S	33/1-34/1
E	8.25	Potential Wetland Area	Galt	Sacramento	300	N to S	34/1-35/1
E	10.75	Bear Slough	Lodi North	Sacramento & San Joaquin	<100	N to S	37/1
E	11.2	Dry Creek	Lodi North	Sacramento & San Joaquin	<100	N to S	37/1-38/1
E	12.6	Mokelumne River	Thornton	San Joaquin	150	N to S	38/1-39/1
E	22.5	Telephone Cut	Terminous	San Joaquin	100	N to S	48/1-49/1
E	24.3	Pixley Slough	Terminous	San Joaquin	100	N to S	50/1-51/1
E	24.5	Bear Creek	Terminous	San Joaquin	150	N to S	50/1-51/1
E	25.25	Mosher Slough	Terminous	San Joaquin	200	N to S	51/1-52/1
E	26.6	Fourteen Mile Slough	Terminous	San Joaquin	200	N to S	52/1-53/1
E	26.7	Sewage Disposal Ponds	Terminous	San Joaquin	900	N to S	52/1-53/1
E	29	San Joaquin River (Stockton DWSC)	Holt	San Joaquin	600	N to S	55/1-56/1
E	30.2	Mokelumne Aqueduct	Holt	San Joaquin	100	NE to SW	56/1-57/3
E	37.4	Middle River	Holt	San Joaquin	300	NE to SW	63/1-64/1
E	43.4	West Canal	Clifton Court Forebay	Contra Costa & San Joaquin	400	E to W	69/1-70/1
E	44.7	Mendota Canal	Clifton Court Forebay	Contra Costa	250	NE to SW	70/1-71/1

Table 4.15-1. Water Crossings

Segment	Mile-post	Water Body[1]	CA Quad	County	Width[2] (feet)	Direc-tions	Structure Number
F	0.3	Curry Creek	Pleasant Grove	Sutter	<100	N to S	
G	2	Curry Creek	Pleasant Grove	Sutter	<100	N to S	
G	2.9	Curry Creek	Pleasant Grove	Sutter	<100	N to S	

Source: Original 2002
[1] USGS California topographical quadrangle sheet title
[2] Approximate width along transect as measured off topographic maps

Segment C crosses this canal less than one mile south of Elverta Substation, then roughly parallels the canal on the west side until crossing it again at about MP 7.5. Surface water becomes much less common after the route crosses Interstate 80 at about MP 5.3 and enters more intensive urban development, but there are still canals and drainage ditches, as well as smaller ponds and wetlands.

Segment D is 15.2 miles long and starts at Hurley Substation. It trends southeast before crossing the American River at MP 2.5, then heads south-southeast through progressively less industrial and urbanized areas before it reaches Hedge Substation at about MP 7. Segment D then trends due south, passing the City of Elk Grove on the east at MP 14 and reaching Elk Grove Substation at MP 15. The portion north of Hedge Substation has relatively little surface water compared with the segments further north, crossing only one creek of note, Morrison Creek. South of Hedge Substation, the segment passes through agricultural land with scattered newer housing subdivisions and crosses several creeks. The creeks in this area are, for the most part, natural drainages, not highly developed or rerouted like the creeks and sloughs north of Sacramento. There is much less irrigation in this area, and grassland pasture mixed with some cropland predominates.

Segments E and E_1 are the longest segments at 46.2 miles (Figures 3-6 and 3-7). They proceed south from Elk Grove Substation to about MP 31, then turn southwest into Tracy Substation. At MP 3.5, the segment starts to cross the Cosumnes River and its associated creeks, ditches, ponds, and wetlands. This surface water complex extends about 8.5 miles, and is characterized by pastureland with some cropland. Beyond MP 9, the route crosses several more creeks, ditches, and sloughs before crossing the Mokelumne River at MP 12.5. South of the Mokelumne River, the route crosses many developed canals, drainage ditches, and vineyards with some mixed cropland.

Between MP 19.5 and 29, the route skirts the east side of a large number of intensively developed irrigated fields surrounded by sloughs and wetlands. The segment passes west of Stockton at MP 27 and crosses the San Joaquin River and Stockton Deep Water Channel at MP 29. At MP 31, still crossing numerous irrigation canals and ditches, the route turns southwest, paralleling Trapper Slough, and continues to cross irrigated cropland. At MP 37.5, the segment crosses the Middle River, and at MP 43.5, the segment crosses the inflow to the Clifton Court Forebay, a manmade water body with almost 3.5 square miles of surface area. The inflow is fed immediately upstream by the Grant Line Canal, Farman and Bell Canal, Old River, and the Delta-Mendota Canal. After crossing the Delta-Mendota Canal at MP 44.8, the segment terminates at Tracy Substation at MP 46.2.

In terms of water resource sensitivity, the entire study area has abundant surface water that could be impacted. However, the entire area is flat, and stream gradients are extremely small. Vegetation reestablishes itself rapidly given the amount of water and growing conditions. Erosion potential is very small as a result. Span lengths at rivers are well within the maximum spans between structures, allowing structures to be located well back from the rivers. The Cosumnes River is the most sensitive area crossed, as there are a number of streams feeding into the river in a wide floodplain at this point. The area is also included in the Cosumnes River Preserve. However, two existing transmission lines on maintained ROW presently traverse this area, and only Alternative 3 would require a new transmission line on new ROW through this area.

4.15.2 Environmental Consequences

Construction and maintenance potential impacts on water resources by the Proposed Action or alternatives would be very similar, although the specific locations might vary depending on the alternative selected. Alternatives that include new transmission lines would have a higher potential for impact than those involving reconductoring. Impacts from access road construction use would be similar for all alternatives, but alternatives requiring more new access roads would have a higher potential for impact. Potential impacts from fuel and chemical spills would be similar for all alternatives. Because of the vast amount of surface water in the study area, some impact to water

resources is unavoidable, but erosion potential is small given the lack of terrain relief, low stream and river gradients, and rapid revegetation conditions.

4.15.2.1 Standards of Significance

The Proposed Action and alternatives would have significant and adverse effect on water resources if they

- Substantially degrade water quality,
- Contaminate a public water supply,
- Substantially degrade or deplete groundwater resources,
- Interfere with groundwater recharge, or
- Cause substantial flooding, erosion, or siltation.

4.15.2.2 Environmental Protection Measures

EPMs for water resources from Table 3-4 include the following:

- Hazardous materials would not be drained onto the ground, into streams, or into drainage areas. All construction waste, including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials, would be removed to a disposal facility authorized to accept such materials.
- Irrigation system features, which are eligible for the NRHP, would be avoided during the siting of new transmission line structures and access roads, and most other irrigation system features would be avoided to the extent practicable in the siting of new structures and access roads.
- In construction areas (for example, material storage yards, structure sites, and spur roads from existing access roads) where ground disturbance is substantial or where recontouring is required, surface restoration would occur.
- Access roads would be built at right angles to the streams and washes to the extent practicable. Culverts would be installed where needed. All construction activities would be conducted to minimize disturbance to vegetation and drainage channels.
- Excavated material or other construction materials would not be stockpiled or deposited near or on stream banks, lake shorelines, or other watercourse perimeters where they can be washed away by high water or storm runoff or can encroach, in any way, upon the watercourse.
- Nonbiodegradable debris would not be deposited in the ROW. Slash and other biodegradable debris would be left in place or disposed.
- All soil excavated for structure foundations would be backfilled and tamped around the foundations, and used to provide positive drainage around the structure foundations. Excavated soil excess to these needs would be removed from the site and disposed of appropriately.
- Wherever possible, new structures and access roads would be sited out of floodplains. Due to the abundance of floodplains and surface water resources in the study area, complete avoidance may not be possible, and Western will consult with USACE.
- Culverts would be installed where needed to avoid surface water impacts during construction of transmission line structures. All construction activities would be conducted in a manner to avoid impacts to water flow.
- All construction vehicle movement outside the ROW normally would be restricted to predesignated access, contractor-acquired access, or public roads.
- When feasible, all construction activities would be rerouted around wet areas while ensuring that the route does not cross sensitive resource areas.
- Dewatering work for structure foundations or earthwork operations adjacent to, or encroaching on, streams or watercourses would be conducted to prevent muddy water and eroded materials from entering the streams or watercourses with construction of interceptors.
- Runoff from the construction site would be controlled and meet the RWQCB storm water requirements.
- Construction within jurisdictional waters or wetlands may require 401 and 404 permits. These activities would be coordinated with the USACE and RWQCB, as needed. Thus, there would be no significant impacts.

4.15.2.3 Impacts from Proposed Action–New Transmission O'Banion Substation to Elverta Substation; Realignments; Reconductoring Elverta Substation to Tracy Substation

The Proposed Action would involve the greatest number of new structures compared to the other alternatives, resulting in 66 acres of long-term disturbance. Using the EPMs, the Proposed Action would not substantially degrade water quality, contaminate a public water supply, degrade or deplete groundwater resources, interfere with groundwater recharge, or cause any substantial flooding, erosion, or silting. Therefore, no significant impacts would be expected.

4.15.2.4 Impacts from Alternative 1—Reconductoring O'Banion Substation to Tracy Substation

Alternative 1 would involve fewer new structures than either the Proposed Action or Alternative 3. It would have more new structures than Alternative 2. Alternative 1 is entirely reconductoring, which would have less environmental impact than new construction on new ROW. Alternative 1 would also not impact any additional acreage, as it would be constructed entirely on existing ROW using existing access roads.

Using EPMs, Alternative 1 would not substantially degrade water quality, contaminate a public water supply, degrade or deplete groundwater resources, interfere with groundwater recharge, or cause any substantial flooding, erosion, or silting. Because it is entirely a reconductor project, with minimal surface disturbance, Alternative 1 would have the least impact to water resources. However, no alternative would cause significant impacts to water resources. The comparison of alternatives assesses various levels of minor impacts.

4.15.2.5 Impacts from Alternative 2—New Transmission O'Banion Substation to Elverta Substation and Realignments

Alternative 2 would have exactly the same impact on water resources as the Proposed Action north of Elverta Substation. It would temporarily disturb 515 acres and disturb 66 acres for the long term. Alternative 2 would require fewer new structures than any alternatives and the same number of new access roads as the Proposed Action. Using EPMs, Alternative 2 would not substantially degrade water quality, contaminate a public water supply, degrade or deplete groundwater resources, interfere with groundwater recharge or cause any substantial flooding, erosion, or siltation.

4.15.2.6 Impacts from Alternative 3—New Transmission Elk Grove Substation to Tracy Substation

Although the impacts of Alternative 3 would be confined between Elk Grove Substation and Tracy Substation, it would be all new construction on new ROW. Therefore, this alternative affects more acreage and requires more miles of access roads than any other alternative. This alternative also has the highest potential impacts to water resources. Even so, no significant impacts have been identified. Using EPMs, Alternative 3 would not substantially degrade water quality, contaminate a public water supply, degrade or deplete groundwater resources, interfere with groundwater recharge, or cause any substantial flooding, erosion, or siltation.

4.15.2.7 Impacts from the No Action Alternative

Under the No Action Alternative, the existing 230-kV transmission system between O'Banion Substation and Tracy Substation would be operated and maintained as it is presently. Western would periodically access the line for routine maintenance or emergency repairs along the existing ROW and access roads. Depending upon the location and the season, temporary and insignificant impacts to water resources could occur because of vehicle access for maintenance purposes. Routine vegetation management activities could also cause temporary insignificant impacts by increasing the potential for erosion and sedimentation by removing ground cover and soil compaction. There would be very low risks of physical damage to irrigation improvements or fuel spills during fieldwork, but the damage would promptly be repaired or spills cleaned up under Western's policies and applicable environmental law and regulations.

4.16 WETLANDS

4.16.1 Affected Environment

This section describes existing wetland conditions within the study area and how the Proposed Action and alternatives would affect wetlands. Wetlands provide natural flood protection and erosion control, recharge surface and ground waters, and maintain and improve local water quality. They are among the most productive and biologically diverse ecosystems in the world, providing dynamic, specialized habitat for a wide variety of common and rare plant and animal species. Environmental regulations have been developed to preserve and protect the unique habitat types and species they support. Table 4.16-1 and Figures 4-4, 4-5, and 4-6 present the wetlands within the study area.

Activities affecting wetlands are regulated under Section 404 of the CWA (33 U.S.C. §1344 *et seq.*) and EO 11990, Protection of Wetlands (42 FR 26961). Areas that meet wetland criteria, established by the USACE, are subject to the regulatory jurisdiction of USACE, pursuant to Section 404 of the CWA. DOE policy and procedures in 10 CFR 1022 ensure that DOE activities in wetlands comply with the EO requirements. This section contains information on avoiding activities impacting wetlands to comply with 10 CFR 1022.

4.16.1.1 Resource Study Area

The study area for wetland resources is the transmission line corridor along the existing ROW alignments. This includes ROW intersections with portions of the Sutter Bypass, the Feather, American, Cosumnes, Mokelumne, San Joaquin rivers, and smaller tributaries and flood-